Grade: 4th-Adult
Time: 1-1/4 hour
Season: All

SURVIVAL SHELTER BUILDING

National Science Teaching Standards

A. Science as **INQUIRY**
B. PHYSICAL Science
D. EARTH Science
E. Science **TECHNOLOGY**
F. Science in **PERSONAL** and **SOCIAL PERSPECTIVE**

Background Information:

In a survival situation, it may be necessary for campers, hikers, hunters, or family vacationers to construct a shelter for protection from the elements. The type of shelter constructed will depend on the season, materials available, time of day, and the person's physical condition, energy level, and ingenuity.

For example, in the situation of an autumn night with little chance of rain or snow, the best shelter may be to find a big pile of dry leaves in a ravine out of the wind and immerse yourself in them. Thus you are well insulated without wasting energy carrying logs and without sweating which would make you clothes wet and reduce their insulation value.

If a storm was possible and more room was needed for more people, equipment or firewood, a lean-to may be more suitable. A horizontal bar (stick) placed between two tree notches a few feet off the ground provides support for the smaller branches leaned against it. To make the lean-to more secure, you can interweave branches together or placed snow against the back side. By constructing a heat deflector of logs or stones in front of the lean-to and then building a small fire between the deflector and lean-to, you can add extra warmth to your temporary home.

Shelters need not be permanent, as most people who are lost are found within 24 hours. A good activity to keep someone busy on their second day in the woods is to make their shelter more permanent.

Finding or making shelter is the first priority. To survive the elements, you must keep warm, especially in the winter, avoid exhaustion, stay hydrated, and be aware of your surroundings.

The key to shelter building is to know how to stay warm, so you should know how your body loses and produces heat:

LOSE: Conduction - heat loss through direct contact with a colder object. Cold water conducts heat 25 times faster than air, so stay dry.
Convection - heat loss through wind. Body temperatures alone creates 4 mph wind.
Radiation - heat loss through radiated body heat. The body generates heat equivalent to a burning candle.
Respiration -- heat and moisture loss through breathing

Evaporation - heat and water loss through cold, dry air absorbing water in the lungs.
PRODUCE: you generate heat by eating food and exercising. Simple sugars create heat faster; fats take longer. Exercising is a good way to stay warm, but only work at 60 percent your full effort. This conserves energy and keeps you from sweating; perspiration can freeze and make you colder.
An Eskimo heating method: 10 minutes of vigorous activity, producing heat in the body's core, then curl up in a ball or stay squatting on your feet, which reduces the surface area to volume ration. Rest and conserve energy and repeat as needed.

Follow the "COLD" rule for winter clothing:

C: keep yourself and clothes CLEAN
O: avoid OVERHEATING
L: wear clothes LOOSE and in LAYERS
D: keep Dry

Use wool or some other recommended synthetic fiber (like Gortex or a poly-blend), but absolutely NO COTTON! Cotton retains moisture from the atmosphere and from perspiration and is slow to dry. It also pulls heats form the body 25 times faster when it is wet.

Objective:

Students will learn basic shelter construction techniques by building a shelter suitable for one person to stay overnight in the outdoors. Builders will explain their shelters and classmates will verbally evaluate the shelters. Students will learn that preparedness is essential to survival in outdoor excursions. Students will learn about the symptoms of hypothermia.

Pre Activity:

Show the “Survival” DVD (borrow from Springbrook)

Equipment:

~1 acre of outdoor wooded area with fallen limbs, twigs, leaves

Procedure:

1. Present the challenge:

They are in a survival situation and find themselves stranded in an unknown area and need to make a shelter so they will be protected from the elements for the night.

2. Each group is to build a shelter with the intent that they are staying overnight in the outdoors. **They can build it for one person or for their whole group to fit into. ONLY NATURAL MATERIALS ALREADY DEAD CAN BE USED (logs, twigs, leaves. don't break things off trees because it may be a live tree) .**

WATCH FOR POISON IVY - vines that appear very hairy/with many small roots coming out if it. Other vines in this area are wild grape and Virginia creeper (also has small rootlets but not like poison ivy. **If not sure, don't touch!**

3. Before students begin working on shelters:

- ask students what do they think they need to think about when building their shelter for building their shelter, think about:
- Protective enough for the conditions?
    - will it keep you dry and protect you from the wind?
    - does it take advantage of warm sunlight if heat is needed?
    - think about which way the wind is blowing
    - think about what if it rains tonight
    - strong enough with stand snow and ice if these are the conditions?

- Size and construction
    - is it large enough for a bed and backpack yet small enough to retain body heat and reduce wasting energy in constructing it?
    - think about keeping body heat in (in a huge room, body heat will escape; hard to keep warm)

5. Divide students into small groups (4-6 per group).

6. Place groups within an acre or so of land. They can choose their own spot but can remind them to:

- Think about what would be a good place to start this shelter.
- Think about keeping warm, the wind direction, level of ground, sturdiness, weather

7. As shelters are being built, go around and test sturdiness and/or discuss structure by asking questions. Students can show you how they get in and out of their shelter. (Allow about 20 minutes for building shelter)

8. After shelters are completed each shelter group will share:

- Builders will inform group why they chose their site, and built it the way they did (talk about specifics).
- Classmates will be encouraged to ask questions or offer suggestions.
- Comment on positive areas of the shelter and ask questions on areas that might need rethinking on the builders' part.

9. Have students dismantle their own shelter, after evaluating them, by carrying their wood, leaves, twigs away from their site and scattering them, not throwing them, back into the woods. You want it to look like no one was there so the next group of students won't be able to tell where previous shelters were made and with what.

Post Activity:

- Have students (in groups) create a realistic survival situation. Write it out. Switch with another group. Come up with a skit that would show a realistic solution to the problem. Share skits with class.
- Make a list of rules to follow when going on an outdoor adventure.

Post Discussion:

- Discuss how you would build a shelter in another habitat…prairie, wetland.
- What other outdoor skills would be helpful in a survival situation?
- **Emphasize**: always tell someone where you are going and when you plan to return. If there is a change in plans, call to let someone know.
- Staying calm in a chaotic situation is difficult; come up with some ideas of how to do this in a survival situation.